

A R T I C L E S

THE NATURAL ENVIRONMENTAL STRATEGIES OF INTERNATIONAL FIRMS: OLD CONTROVERSIES AND NEW EVIDENCE ON PERFORMANCE AND DISCLOSURE

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Previous academic and popular literature has raised important debates concerning the contradictory incentives for international firms to reduce their environmental impacts and offer transparent environmental information about their operations. As an exhaustive review of this literature revealed mixed and partial evidence, we compared the individual corporate environmental performance and disclosure of the 100 most international nonfinancial firms in the world to those of 16,023 firms in their industries and a group of selected firms similar to those in the group of the 100 most international in our sample. Our results show that although the top international firms have a much better record of environmental disclosure than the firms within their industries and the matched pairs, the top international firms actually show worse environmental performance than their peers. The results suggest that the top international firms seek legitimation for their environmental activities by means of voluntary disclosure.

After 20 years of research, the relationship between international firms and the natural environment is still controversial. Do multinational companies pollute more or less than similar firms without an international orientation? Do they provide more or less environmental information on their

operations? Advocates of world trade have argued that international business can play a positive role in the diffusion of environmentally friendly technologies (WTO, 2014). In contrast, Greenpeace reports frequent complaints about suspicious environmental practices by large international corporations (Bruno, 2012). Management research has focused mainly on the potential benefits of firms being environmentally proactive in their international activities (e.g., Christmann, 2004; Delmas & Montes-Sancho, 2011), yet there are doubts regarding whether international firms' overseas activities promote or prevent the diffusion of environmental improvements (e.g., Devinney, 2009; King & Shaver, 2001; Van der Byl & Slawinski, 2015).

Our interest in these questions is relevant because of the growing importance of the interactions of environmental and international issues in multinational

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businesses. The flow of goods and services between countries is growing and having ever greater effects on the environment. The United States exported \$2.272 trillion worth of goods and services in 2013, a record annual volume representing an increase of 2.7% over the previous year. In 2013, exports from Japan grew 9% and those from the United Kingdom grew 1.3%, while German exports increased 0.5% (WTO, 2014). International treaties and the domestic actions of governments and industries have had limited effects in moderating the environmental damage of this growing international activity. Cross-border cooperative regulatory approaches have also languished (Marcus, Aragón-Correa, & Pinkse, 2011). Without these treaties and actions on the part of governments and industries, consumers are relatively impotent in terms of having an effect via purchasing decisions (Auger & Devinney, 2007; Delmas, Etzion, & Nairn-Birch, 2013).

Until now, the literature has failed to generate a compelling logic concerning how the international expansion of firms affects the world's environment (Devinney, 2009). Although no single weather episode proves climate change, there is wide scientific consensus that human activities carried out by global businesses have contributed to extremes of weather (Holdren, 2014). It is estimated that extreme weather events have cost the United States more than \$1.15 trillion since 1980 and could cost another trillion in coming years (Breitman, 2014). In this context, what international firms do and their effects on the environment are important matters.

In this paper, we begin by reviewing the literature on the controversies regarding the pollution haven hypothesis and that on the environmental disclosure of international firms. As far as we know, these two literatures have not yet been examined together. Our literature review therefore provides the motivation for a fresh examination of the empirical evidence. This paper's empirical analysis is based on an assessment of the environmental performance and disclosure of the top 100 international nonfinancial firms in the world (SCOPE, 2014)—that is, those that are the most internationalized. We compare these firms to 16,023 other firms and a group of selected firms similar to those in the group of the 100 most international in our sample. Previous research has been fragmented and based on limited samples and on managers' self-evaluations. The analysis we undertook was more holistic than previous analyses because of the range of variables we considered and the number of firms we analyzed. We introduce new and relevant data into prior debates, and provide

a more solid foundation for our results and for further analysis.

Our results show that top international firms have better records of environmental disclosure, but their environmental performance is worse than that of other firms in the industry and matched pairs of firms that do not have an international orientation. These findings suggest that the international firms sampled look for legitimation through their voluntary environmental disclosure, even though their environmental performance is not as good as that of other firms. These findings raise new questions about our understanding of two central debates in the literature: first, the pollution haven hypothesis, and second, the environmental transparency of international firms.

THE POLLUTION HAVEN HYPOTHESIS VERSUS GLOBAL IMPLEMENTATION OF ADVANCED ENVIRONMENTAL PRACTICES

The pollution haven hypothesis posits that domestic firms shift their production to countries with less restrictive environmental standards to preserve competitiveness (Hufbauer & Schott, 1992). Because they can carry out "dirty" operations in countries with lax standards, they are able to reduce their costs (e.g., Chang & Rosenzweig, 2001; King & Shaver, 2001; Stewart, 1993). They obtain competitive advantage from the environmental damage they cause. Porter and van der Linde (1995) challenged this line of reasoning and argued that strict domestic regulation puts pressure on firms to increase the productivity of their resources. This stimulates environmental innovation that firms export to countries with lax standards. These authors argued that resisting pollution-reducing innovation, as in the case of the U.S. car industry in the 1970s, leads not only to environmental damage but also to a loss in global competitiveness.

Subsequent research, however, has found that the final choices firms make in this domain are conditioned by at least three factors: domestic and global regulatory frameworks, the firm's internal capabilities, and its external ties to stakeholders. The regulation of a multinational enterprise by a home country is a fixed baseline, and consideration must be given to whether firms should keep pace with domestic environmental requirements or move a part or all of their activities to countries with less stringent requirements. Porter and van der Linde (1995) strongly supported incentive-based approaches, such as pollution taxes, marketable permits, and deposit refund schemes, rather than

traditional command-and-control environmental regulatory approaches, such as mandated control technologies. However, the environmental regulatory system in most countries is inflexible and does not consist of these kinds of approaches.

In addition, Porter and van der Linde (1995) did not consider global regulatory treaties that are relevant in understanding firm choices. Although most environmental regulations are developed at the nation-state level (Marcus, Aragón-Correa, & Pinkse, 2011) and most studies focus on the influence of domestic environmental regulations (e.g., Christmann, 2004; Dam & Scholtens, 2008; Kolk & Pinkse, 2008), global treaties such as the Kyoto Protocol, when in force, also influence firms' environmental choices. Because of the uncertainty generated by flexible global treaties (Marcus, Aragón-Correa, & Pinkse, 2011), as well as differences in domestic regulations and regulation in countries in which a firm's subsidiaries are located (Aguilera-Caracuel et al., 2013), innovations in environmental practices may tend to lag behind a firm's capabilities. Rugman and Verbeke (1998a, 1998b), therefore, developed a contingency approach to highlight that firms' internal capabilities, as well as the regulations and conditions in the countries in which they operate, influence the decisions they make.

Many recent studies have focused on the standardization of firms' global environmental practices and policies (e.g., Christmann, 2004; Delmas & Montes-Sancho, 2011; Orlitzky, Siegel, & Waldman, 2011; Rivera & deLeon, 2008). In contrast to having to cope with different approaches in different countries, standardization assists with internal coordination and makes it simpler for firms to adhere to consistent cross-border environmental policies. The interests of and pressures from international firms' stakeholders contribute to the degree to which multinationals favor standardized approaches (e.g., Christmann, 2004; Orlitzky, Siegel, & Waldman, 2011). To improve their relations with stakeholders, including employees, suppliers, green and human rights activists, investors, and corporate and individual customers, some multinationals have created integrated and consistent cross-border environmental sustainability and corporate social responsibility policies. Even when regulations are weak or uncertain, these companies do not want activists to harm their image (Bondy & Starkey, 2014; Surroca, Tribo, & Zahra, 2013); thus, they choose to regulate themselves (Christmann & Taylor, 2002, 2006; Delmas & Montes-Sancho, 2011; King & Lenox, 2000). Stakeholder pressure influences the decisions they make about whether to export pollution or diffuse advanced environmental practices.

In summary, the literature suggests that the extent to which firms innovate in response to strict domestic environmental regulation to achieve sustained competitive advantage depends on the types of regulation firms confront domestically and globally, their internal characteristics, and their ties to stakeholders. In the next section, we take up the issue of why some firms are transparent with regard to information about their global environmental activities that can damage their reputations.

ENVIRONMENTAL DISCLOSURE AND ENVIRONMENTAL PERFORMANCE

Although the majority of business firms are still not particularly transparent, over the past decade there has been a substantial increase in the number of companies willing to be involved in disclosure (Jose & Lee, 2007). KPMG (2011) found that 95% of the world's largest multinational companies published a sustainability report, but Milne and Gray (2007) estimated that only about 2,000 of the 60,000 multinational companies that operate globally did so. The lack of voluntary environmental reporting has continued even after an increase in the number of countries passing regulations requiring some sort of public disclosure (Kuo & Chen, 2013; Martin & Hadley, 2008).

Recent papers have provided exhaustive reviews of the literature on corporate environmental disclosure and the organizational implications of coercive and voluntary disclosure (e.g., Doshi, Dowell, & Toffel, 2013; Lewis, Walls, & Dowell, 2014). Other than government pressure, the motivations for disclosure include the influence of stakeholders, the characteristics of the organizations themselves, and pragmatic rationales that managers may formulate for openness. The stakeholder perspective (Freeman, 1984; Hörisch, Freeman, & Schaltegger, 2014) suggests that demands from stakeholder groups in particular lead to increased disclosure (Lewis, Walls, & Dowell, 2014). Environmentally active investors, customers, regulators, and nongovernmental organizations pressure firms to be forthcoming about their behavior (Clarkson et al., 2008). In developed nations, the visibility of international firms attracts attention from well-organized stakeholder groups. However, in developing countries there is likely to be limited direct interaction with demanding stakeholders and less interest in disclosure.

Therefore, the organizational approach to environmental disclosure looks for internal characteristics of the firm that are linked to managers' decisions to be environmentally transparent. A qualitative

analysis of 23 Australian firms in various industries (Stubbs, Higgins, & Milne, 2013) suggested that organizational structure and culture play a role in some firms' decisions to produce comprehensive and publicly available reports on their social and environmental performance. Many studies have analyzed the characteristics of companies that report environmental information (for a recent review, see Lewis, Walls, and Dowell, 2014). They have found that characteristics such as company size, industry type, and geographic location significantly affect voluntary disclosure (e.g., Albertini, 2014; Meek, Roberts, & Gray, 1995). Very large firms, companies that are in high-polluting industries (e.g., mining, energy, and chemicals), and companies in the financial sector have a higher incidence of voluntary environmental reporting (Dawkins & Fraas, 2011; Meng, Zeng, Tam, & Xu, 2013). Lewis, Walls, and Dowell (2014) have examined the influence of CEO characteristics on this type of disclosure and found that they too play a role.

The pragmatic approach to environmental disclosure suggests that managers engage in a cost-benefit calculation, as a result of which companies become more inclined to reveal environmental information when the perceived benefits outweigh the perceived costs (Verrecchia, 1983). Firms in difficult environmental straits usually prefer to avoid the risk of offering this information to the public for scrutiny. A benefit that multinationals obtain from disclosure is enhanced reputation with stakeholders and legitimation (Aerts & Cormier, 2009; Godfrey, Merrill, & Hansen, 2009; Hassan & Ibrahim, 2012); the potential costs include legal liability and exposure to potentially angry activists and stakeholders (Cormier & Magnan, 1997; Lyon & Maxwell, 2011). According to the pragmatic perspective, the decision to disclose is the result of balancing these costs and benefits. If environmental disclosure on balance achieves the goal of greater legitimacy and less liability, companies are likely to be more transparent.

The previous literature on environmental disclosure has been predominantly related to these factors. A limitation of the literature is that it has not systematically examined the relationship between environmental disclosure and environmental performance. It is generally assumed that mandatory disclosure policies that require organizations to reveal information should prompt them to improve their environmental performance (Greenstone, Oyer, & Vissing-Jorgensen, 2006; Weil et al., 2006). However, the prior literature has not systematically paid empirical attention to this issue. An exception is

Hassan and Ibrahim (2012), who found that receiving environmental awards is positively related to disclosure but not to performance.

Other impacts of disclosure have been investigated: Using a sample including firms from both continental Europe (Belgium, France, Germany, and the Netherlands) and North America (Canada and the United States), Aerts and Cormier (2009) showed that enhanced environmental disclosure translates into more precise earnings forecasts by analysts. These relationships are stronger in Europe than in North America, suggesting different climates for environmental disclosure in different locations.

To address this possibility, we carried out an exploratory analysis of the relationship between disclosure and performance among top multinational firms. Our data came from the research group SCOPE (at the Erasmus Rotterdam School of Management) and the relatively new Bloomberg Environment, Social, and Governance (ESG) database. We posit that there may be four ways in which environmental performance and environmental disclosure are related in international firms. Figure 1 illustrates the four alternatives.

First, if performance is high and disclosure is high, strategic environmental leadership is carried out. Advanced environmental practices are diffused globally in order for a company to set a high bar for its competitors and achieve both reputational and competitive advantage.

Second, if performance is high and disclosure is low, quiet environmental leadership is demonstrated, but without disclosure there is less likely to be imitation and diffusion. The choice to be quiet may arise from a desire to protect proprietary information. Another possibility is that the company does not want to attract attention from activists. Yet another option is that it cannot afford the cost of public reporting. Without disclosure, however, the company may not achieve reputational or competitive advantage.

Third, if performance is low and disclosure is high, the main purpose of disclosure is likely to be legitimation of a company's existing practices. Disclosure is a way of obtaining a license to operate. The risk, however, is that armed with the environmental information that the company reveals, activists might not be pacified and their demands not neutralized because disclosure takes place without a concurrent improvement in performance. The main reason for disclosure, then, is to maintain and/or improve a company's reputation despite the shortfall in its performance.

FIGURE 1

The Relationship Between Environmental Performance and Disclosure Among Multinational Firms

		Environmental performance	
		High	Low
Environmental disclosure	High	Strategic environmental leadership	Legitimation of existing practices
	Low	Quiet environmental leadership	Pollution haven

Fourth, if performance is low and disclosure is low, conforming to the pollution-haven hypothesis, there are reasonable grounds to suspect that environmental degradation is being exported to countries with lax standards without the public's knowledge. A company is being secretive about its practices because it does not want the public to know it is sending its pollution abroad. Our empirical analysis will also provide specific illustrations related to these alternatives.

EMPIRICAL EVIDENCE

Sample

The empirical evidence we have gathered focuses on the top 100 international nonfinancial companies worldwide. We compared the environmental disclosure and performance of these firms to those of other firms in their industries and a matched sample. The ranking of the "top international firms" comes from the SCOPE research group (at the Erasmus Rotterdam School of Management) and is based on the estimated absolute size of their assets outside their home country (SCOPE, 2014). This ranking is different from most other global rankings of companies, which do not distinguish between companies' domestic and international activities. We linked these firms with their respective five-digit NAICS codes in the Bloomberg database, which is used to identify the baselines for subsequent comparisons. The industries in our sample of top 100 international firms belong to nine categories in the Global Industry Classification System: consumer discretionary, consumer staples, energy, healthcare, industrials, information technology, materials, telecommunications, and utilities. These industries include 16,023 corresponding firms in the Bloomberg database.

We used the Bloomberg Environment, Social, and Governance database to gather information on the environmental performance and disclosure of each

of the top 100 international firms and each of the 16,023 corresponding firms. The Bloomberg ESG database provides detailed values on corporate sustainability indicators and is publicly available to researchers, industry, and financial stock market experts. Much of the environmental information in the Bloomberg ESG database comes from the Carbon Disclosure Project, a nonprofit organization collecting and disclosing the greenhouse gas emissions of large corporations that voluntarily provide this information. In addition, we have assembled information regarding the size of each firm from the Bloomberg financial database to control for the potential influence of this variable in the results.

Our analysis is limited to the seven-year period of 2006 to 2012; we selected the data for the analyzed firms in the years 2006, 2009, and 2012. We selected this time frame because it is the most recent period with data available, and because the ESG database has been particularly successful in obtaining data for firms since 2005. Our final panel dataset includes the ESG and Bloomberg data obtained by company name. The dataset contains three years of observations of the 100 top international firms and the 16,023 additional corresponding firms in one of the same industries in the Bloomberg database.

To avoid any potential bias in the comparisons of firms with their industries, we also compared the top 100 most international companies with a control group of 100 matched pairs of firms. The matched pairs were selected from the total group. We matched each of the top 100 most international nonfinancial companies worldwide with a similar company in its industry. We used three criteria to identify the matched pairs: industry (demanding the same five-digit NAICS codes in the Bloomberg database), an environmental approach (the same orientation to environmental disclosure, meaning that the matched firms provide information for at least one environmental variable if the matched top 100 international firm does so), and size (measured by the lowest level

in Euclidian distance between the average number of employees in each of the top 100 international firms and the average number of employees in each of the other firms in its industry outside the top 100).

Measures

The Bloomberg ESG database provides individual values for firms concerning a range of variables related to different environmental performance categories. Some of the variables in the ESG database are highly specific for certain activities, whereas other variables are useful for a majority of the activities. For this paper, we have tried to select the most commonly used measures of environmental performance in different industries, analyzed in literature related to environmental outcomes and processes (e.g., Delmas, Etzion, & Nairn-Birch, 2013; Schneider & Meins, 2012).

The *outcome-based measures* take into account only the direct generation of environmental impacts, whereas the process-based measures are related to the utilization of inputs with indirect environmental effects. The environmental outcome variables in our analysis include 1) greenhouse gas emissions in thousands of tons (kt) for nitrogen oxide emissions, volatile organic compounds (VOCs), and particulate emissions; 2) discharges to water in thousand cubic meters (km³); and 3) waste generation in kt for hazardous waste and total waste. The environmental impacts analyzed are considered to contribute directly to climate change and are among the most relevant issues regarding the relationships between business activity and the natural environment. We divided the amounts in absolute terms by the number of employees in the firm to make them comparable to others in the same industry.

The *environmental process-based measures* indicate the firm's efforts to mitigate its environmental impacts (Schneider & Meins, 2012). The environmental process-based variables in our analysis include energy and water used in industrial activity (energy consumption in megawatt hours [MW-h] and water consumption in km³), clean energy (i.e., renewable energy used in MW-h), and recycling (waste recycle in kt). We divided the energy and water consumption by the number of employees in each firm to make them comparable to others in the same industry. The amount of clean energy and waste recycled was divided by the total energy consumption and total water consumption, respectively, to offer a relative picture of their relevance in each firm and simultaneously control for the influence of size. Higher values of

emissions and consumption imply negative environmental performance, while higher values of clean energy and recycling imply positive environmental performance.

The analysis of *environmental disclosure* evaluates transparency in environmental reporting based on company disclosures and reports concerning environmental information. We measured environmental disclosure by the availability (or lack thereof) of information regarding each variable in the environmental datasets annually published by the companies and available in the Bloomberg ESG database. We analyzed the number of firms in the top 100 international firms that publish information for each environmental variable versus the firms in their industries and the group of matched-pair companies publishing the same environmental information

To summarize, our work examines 10 different variables for environmental performance in two different categories: outcomes and processes. We also measured the environmental disclosure of international and noninternational firms for each variable. We compare the values of the top 100 most internationally active firms to industry averages and a matched sample. Table 1 summarizes the variables previously discussed.

RESULTS

Table 2 shows information concerning environmental disclosure in the firms analyzed. The results show dramatic differences between the percentage of firms active in the provision of environmental information in the top 100 international firms and the same percentage in the 16,023 firms belonging to the same industries but not on the list. As illustrated in Table 2, a higher proportion of international firms provide environmental information for every variable and year. For example, 25–73% of the international companies provided environmental information in 2012 (depending on the specific environmental variable). However, only 0.7–4.8% of the other companies analyzed did so in the same year. The average importance of the environmental disclosure in the top 100 international companies grew to 49% in 2012, up from 44% in 2009 and 31% in 2006. This shows continued annual improvement in the number of international firms providing information for the selected environmental variables. Meanwhile, the averages for the rest of the firms analyzed were only 2.3% in 2012, 2% in 2009, and 0.5% in 2006.

The results in Table 2 also show that more international firms provide environmental information

TABLE 3
Environmental Performance of Top 100 International Firms Versus the Other Firms in Their Industries with Environmental Information

Variable		Total industries				Top 100			
		Obs.	Mean	Average		Obs.	Mean	Average	
				Under	Above			Under	Above
Emissions	<i>nox</i>	752	0.13	80.4%	19.6%	127	0.45	46.3%	53.7%
	<i>voc</i>	246	0.69	75.1%	24.9%	90	1.38	58.8%	41.2%
	<i>particulates</i>	246	0.19	88.1%	11.9%	55	2.0	63.5%	36.5%
	<i>wdsch</i>	635	0.14	75.8%	24.2%	82	0.38	42.2%	57.8%
	<i>hazard</i>	504	0.03	91.1%	8.9%	157	0.58	52.7%	47.3%
	<i>waste</i>	1264	0.02	87.7%	12.3%	184	0.4	47.7%	52.3%
Use of resources	<i>energy</i>	1645	0.08	82.5%	17.5%	202	0.34	34.9%	65.1%
	<i>water</i>	1290	0.04	79.8%	20.2%	168	0.13	36.6%	63.4%
Environmental behavior	<i>renew</i>	245	0.15	60.0%	40.0%	63	0.09	70.3%	29.7%
	<i>recycle</i>	870	0.68	44.2%	55.8%	116	0.57	61.7%	38.3%

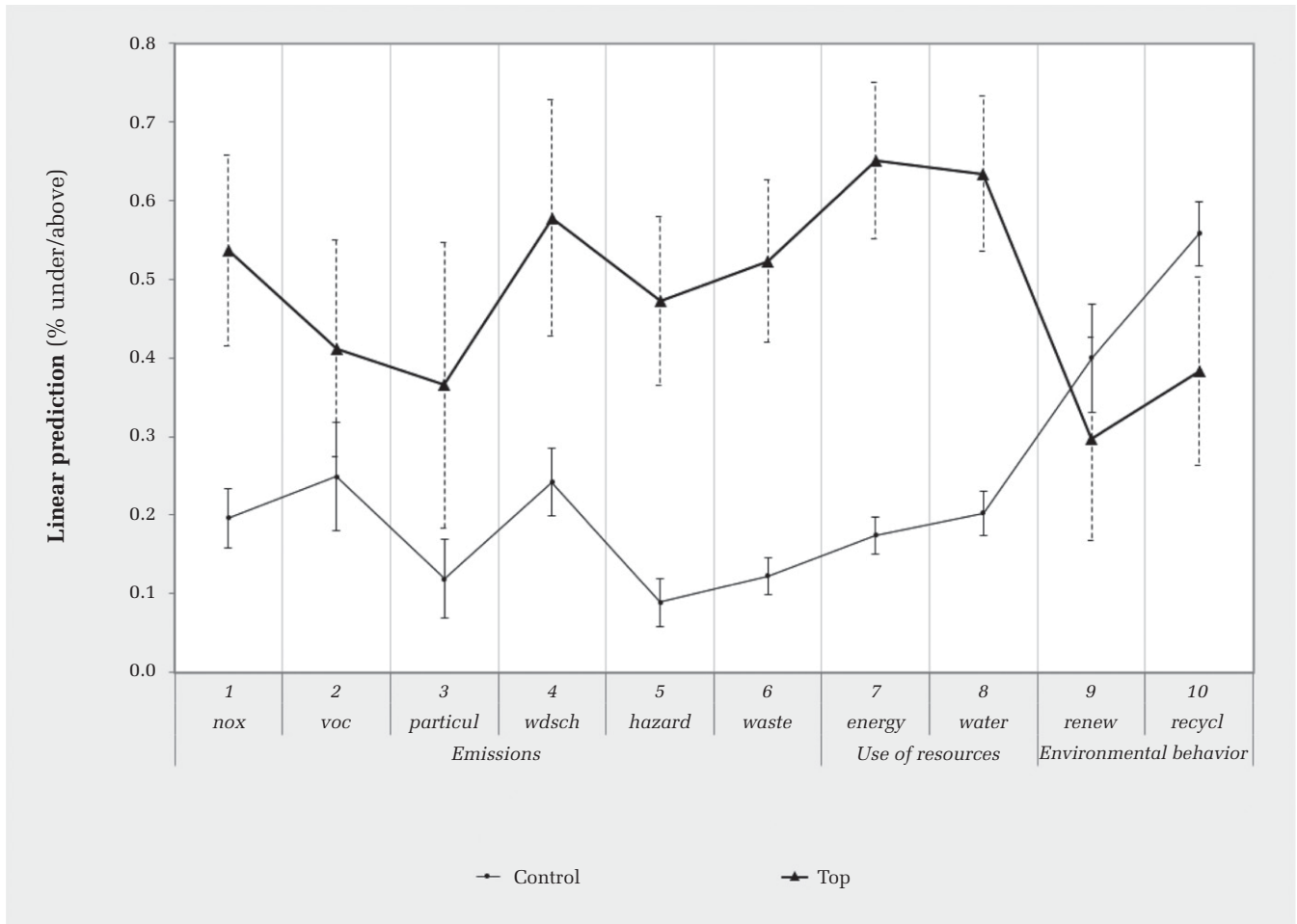
We calculated the average annual environmental performance of each variable for the nine industries in our sample. Table 3 and Figure 2 show the proportions of international and general observations that are below and above the industry averages for each variable. The results show that the percentages of top 100 firms that are above average in use of resources and emissions range from 36.5 to 63.4%. In the other companies, the percentages that are above average in relation to use of resources and emissions are much lower, covering a range from 8.9 to 24.9%. The percentages of companies not in the top 100 that are above average in terms of clean energy and waste recycling are 40% and 55.8%, respectively. In comparison, only 29.7% and 38.3% of the top 100 international companies are above average. Our results show that the top 100 international companies are more prone to poor environmental behavior than the rest of the companies in their industry.

We also applied a two-way analysis of variance (ANOVA) to our panel data to test the differences in the environmental performance of the top 100 international companies and the rest of the companies in their industries that published data on at least one environmental dimension. To determine whether the mean differences observed among these two groups of companies are significant for each variable (see Table 4) we used a post hoc comparison Tukey's HSD test. The results of the tests show strong statistical support for the descriptive evidence of poorer environmental performance in the top 100 international firms versus the other firms in their industries providing environmental data. The results are consistent for each of the three groups of environmental variables.

The results show that the top 100 international companies have poorer environmental outcomes for all indicators than other companies in their industries. For example, there are significant differences in nitrogen oxide emissions (HSD test = 17.005; $p < .01$), VOC emissions (HSD test = 6.538; $p < .01$), particulate emissions (HSD test = 10.867; $p < .01$), discharges to water (HSD test = 4.103; $p < .01$), hazardous waste (HSD test = 14.394; $p < .01$), and total waste (HSD test = 16.176; $p < .01$). The results also show significant differences in the use of resources, both for total energy consumption per worker (HSD test = 21.432; $p < .01$) and total water consumption per worker (HSD test = 7.624; $p < .01$). The test indicates a significant difference in terms of waste recycling (HSD test = 3.997; $p < .01$), but not a statistically significant difference for clean energy (HSD test = 2.825; $p < .01$).

Finally, to determine if the pattern of differences is stable when comparing the top 100 international firms and the specific matched-pair group of firms, we ran a two-way ANOVA and post hoc comparison Tukey's HSD tests. Table 5 shows that the environmental performance in the top international firms is still significantly worse than in the matched pairs for the majority of the variables analyzed. Specifically, five out of six indicators for emissions show significantly worse performance: nitrogen oxide emissions (HSD test = 11.544; $p < .01$), particulate emissions (HSD test = 6.309; $p < .01$), discharges to water (HSD test = 4.773; $p < .01$), hazardous waste (HSD test = 9.290; $p < .01$), and total waste generation (HSD test = 10.633; $p < .01$). For VOC emissions, the differences are not statistically significant. There are significant differences for the two indicators of use of resources:

FIGURE 2
Frequency of Companies Under Means*



* 95% confidence interval mean group.

total energy consumption (HSD test = 15.024; $p < .01$) and water consumption (HSD test = 7.250; $p < .01$). However, the differences are not statistically significant for waste recycling (HSD test = 3.276; $p < .01$) and clean energy (HSD test = 4.140; $p < .01$).

Finally, we simultaneously analyzed the environmental performance and disclosure of some of the firms to provide a descriptive illustration of our findings and exploratory support for our typology. Figure 3 shows the levels of environmental disclosure for one environmental performance variable (energy consumption per employee). The energy consumption variable is not necessarily representative of the whole environmental performance of the firm, but it is useful to consider the environmental variable most widely displayed in the industry. We have focused our representation on a single industry—automotive—to avoid potential confounding effects of uncontrolled variables and

allow a clear representation. This industry is highly internationalized and thus is particularly appropriate for the objectives of this analysis.

The results in the figure have been classified into different quadrants depending on the average levels of each dimension in the industry. The difference-in-differences tests show that the average values of the firms in each category are statistically different, providing exploratory support for our original typology. The smaller points in Figure 3 correspond to the positioning of top international firms in our analysis, the larger points are the average situation of the top international firms (circle), and the diamond-shaped points are the average of the others in the industry. Our results show that the vast majority of the top international firms in this subsample are in the low performance–high disclosure quadrant (including Volkswagen, Fiat, and Nissan) or the low

TABLE 4
Pairwise Comparisons of Environmental Performance of Top 100 International Firms Versus Firms in their Industries with Environmental Information

Variable		Differences of means: total firms with environmental information vs. top 100			Unadjusted comparison		Tukey's method
		Obs.	Value	Std. Err.	χ^2	p-value	HSD test
Emissions	<i>nox</i>	879	0.3227	0.037	80.364	0.000	17.005*
	<i>voc</i>	336	0.6878	0.205	11.178	0.001	6.538*
	<i>particulates</i>	301	1.7794	0.267	39.179	0.000	10.867*
	<i>wdsch</i>	717	0.2407	0.072	11.251	0.001	4.103*
	<i>hazard</i>	661	0.5430	0.057	78.713	0.000	14.396*
	<i>waste</i>	1448	0.4183	0.047	74.706	0.000	16.176*
Use of resources	<i>energy</i>	1847	0.2637	0.022	146.886	0.000	21.432*
	<i>water</i>	1458	0.0893	0.014	39.117	0.000	7.624*
Environmental behavior	<i>renew</i>	308	-0.0608	0.035	3.989	0.046	2.825
	<i>recycle</i>	986	-0.1067	0.075	7.157	0.007	3.997*

(*) Statistical relationship significant at 1% from Tukey's studentized range distribution.

performance–low disclosure quadrant (Ford, General Motors, and Honda). The leading category (high performance–high disclosure) and quiet leadership (high performance–low disclosure) quadrants include just two firms (BMW and Renault, respectively). These results are in contrast to the situation of the less international firms in the industry that are more distributed in each quadrant, even though they are mostly concentrated in the high performance–low disclosure quadrant.

However, the nature of the ESG database does give rise to some questions about the generalizability of our results. The ESG data have three limitations. First, there is no standardized rating system, so it is difficult to ensure data reliability. Second, the companies with

the most to hide are the least likely to volunteer information about their poor ESG practices. Third, this database is still relatively young. It has limited coverage, mostly of large-cap companies over a short historical time period and not an entire economic cycle.

DISCUSSION AND IMPLICATIONS

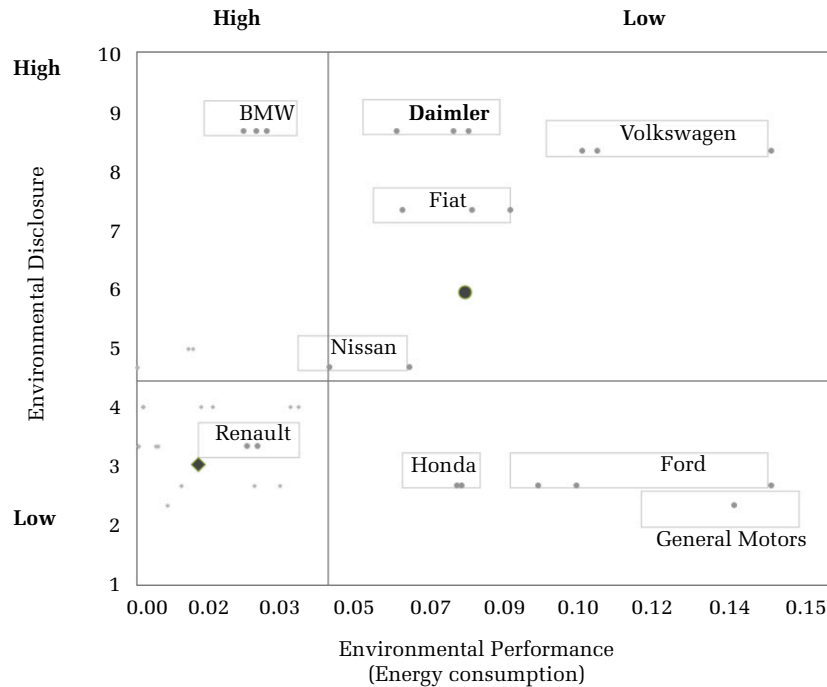
The issues of concern in this paper are, first, the extent to which the activities of global firms have more or less environmental impact than those of similar firms without an international orientation, and second, the extent to which these firms have higher levels of disclosure. The pollution-haven hypothesis suggests that international firms pollute

TABLE 5
Pairwise Comparisons of Two-Way ANOVA Considering Time and Sectorial Effects (Matched-Pair Group Versus Top 100)

Variable		Differences of means: matched-pair group vs. Top100			Unadjusted comparison		Tukey's method
		Obs.	Value	Std. Err.	χ^2	p-value	HSD test
Emissions	<i>nox</i>	194	0.2790	0.064	11.860	0.001	11.544*
	<i>voc</i>	112	0.7043	0.327	2.210	0.137	4.988
	<i>particulates</i>	78	1.4980	0.508	3.865	0.049	6.309*
	<i>wdsch</i>	130	0.1847	0.071	4.132	0.042	4.773*
	<i>hazard</i>	201	0.5035	0.114	7.776	0.005	9.290*
	<i>waste</i>	281	0.3643	0.079	12.026	0.001	10.633*
Use of resources	<i>energy</i>	339	0.2340	0.032	38.631	0.000	15.024*
	<i>water</i>	275	0.0866	0.017	16.573	0.000	7.250*
Environmental behavior	<i>renew</i>	77	-0.0828	0.038	3.009	0.083	3.276
	<i>recycle</i>	182	-0.0826	0.076	2.026	0.155	4.140

(*) Statistic relationship significant at 1% from Tukey's studentized range distribution.

FIGURE 3
Illustration of Environmental Situation in the Automotive Industry



more than noninternational peers because they use their overseas operations as low-cost unregulated areas to pollute (e.g., Chang & Rosenzweig, 2001; King & Shaver, 2001; Stewart, 1993). An alternative view is that there are competitive benefits from the standardization of the high level of internal environmental practices in which international firms engage. Thus, their global expansion diffuses advanced environmental performance methods to nations with weak regulatory regimes (e.g., Christmann, 2004; Delmas & Montes-Sancho, 2011; Orlitzky, Siegel, & Waldman, 2011; Rivera & de Leon, 2008). In addition, it has been argued that international firms may use interactions with less environmentally committed agents in multiple countries to limit the provision of information regarding their environmental impacts, or they may react to incentives to increase their global reputation by providing more of this information (Christmann, 2004; King & Shaver, 2001).

The debates concerning performance and disclosure often overlap because of the common assumption that environmental disclosure and advanced environmental performance are related (Hassan & Ibrahim, 2012). Our results show that leading international firms' pollution records are not as good as those of a matched sample of similar firms or the average records of their industry competitors that

provide environmental information. To understand these results, it is important to consider that top international firms are more likely to reveal environmental information than noninternational firms. Addressing the two relevant debates in the literature on international firms and the environment simultaneously leads us to conclude that top international firms appear to be pursuing a legitimation strategy as opposed to the other options identified—that is, strategic environmental leadership, quiet environmental leadership, and use of pollution havens (see Figure 1). Our findings suggest that they compensate for their pollution levels (to a greater extent than similar firms) by being open about what they are doing; they are not trying to hide what they are doing, but are hoping that this damage will become more socially acceptable because they report it.

Our results are consistent with previous literature that has argued that legitimacy is the most likely motivation for the evolving practice of providing voluntary annual report disclosure (e.g., Deegan & Gordon, 1996; Ernst & Ernst, 1978; Guthrie & Parker, 1990). Previous studies have indicated that large organizations in prominent industries report more voluntary content and report more often than other firms (Albertini, 2014; Dawkins & Fraas, 2011; Meng, Zeng, Tam, & Xu, 2013). Some studies show that the

disclosure of these firms has been tied to accidents and other events that generate threats to their legitimacy (Lindblom, 1993), to stakeholder pressure (Roberts, 1992), and to media interest (Brown & Deegan, 1998).

We provide support for the idea that environmental legitimation is an important consideration. Large multinationals that publicly report what they do, even without making improvements, obtain a social license to operate. Without other factors driving changes in their conduct, this social license provides them with a temporary reprieve from external pressures and permits them to continue with their behavior without significant interruption. Activists and stakeholder groups expect them to be transparent in the hope that disclosure will lead to improved performance, but we have found no definitive evidence of better performance among firms that have higher levels of transparency.

Our results show that the environmental performance of the top international firms is worse than that of their industry peers, but this finding does not necessarily mean that they are using their international operations as pollution havens. For one thing, these firms are not silent about the environmental damage that they cause. Moreover, it is also likely that although the pollution control from their international operations does not compare with the best among their peers, it still exceeds that of local authorities. All else being equal, the risk that disclosure of weak performance will be used by activists and stakeholder groups to tarnish the reputations of firms that pollute (e.g., Bermudez-Edo, Hurtado-Torres, Aragón-Correa, 2010) does not seem to have deterred the firms in our sample (see also Bondy & Starkey, 2014; Surroca, Tribo, & Zahra, 2013).

Future Research

Our results provide impetus for future research that could reexamine the circumstances in which international firms are open to making progress on disclosure and performance. At least three types of research challenges are open for consideration: theoretical, methodological, and inferential.

First, at the theoretical level, we need to update the assumptions found in the early research literature on environmental issues and the implications of these assumptions for international business. Greater environmental disclosure was understood to be a positive and hopeful first step toward better environmental performance. It now appears that disclosure and performance are different dimensions that need to be analyzed independently of each other. Disclosure might

be a smoke screen for poor performance in some situations. Some international firms have chosen this route over improved performance. Disclosure may remove stakeholder pressure, as stakeholders understand it as an expression of goodwill and an implied promise to improve actual performance, but it may be of little benefit to the environment.

These findings need more systematic theoretical frameworks. We need a better understanding of why international firms disclose. At the same time, it is also important to consider if and how disclosure really appeases stakeholder groups and creates corporate goodwill in the absence of improved performance. Theories regarding legitimation and stakeholders are good places to start in investigating these phenomena. There are several issues that could be pursued:

- The degree to which environmental legitimation is a consciously pursued corporate strategy that entails goals that international companies monitor and adjust over time.
- The degree to which stakeholder groups may delegitimize international companies based on the environmental performance gaps the stakeholders uncover and publicize.
- The degree to which government effectiveness in establishing and enforcing environmental standards for disclosure and performance guarantees that legitimacy claims are authentic and real, and the potential incentives that then exist for setting transnational standards.

The literature (e.g., Greenstone, Oyer, & Vissing-Jorgensen, 2006; Weil et al., 2006) that suggests that disclosure is an incentive for performance improvement has recognized that certain conditions must be applied. These conditions include, but are not limited to, effective government policies and international treaties, as well as stronger sets of corporate capabilities, including more sustainable cultures and values among CEOs, directors, and executive teams. If we are to understand the factors that generate incentives for international firms to move beyond disclosure to better performance, then it is critical to gain a better understanding of the role corporations, stakeholder groups, and governments play in the process of legitimation and delegitimation. The role of government is especially important if corporate disclosure turns out to be largely a fig leaf for bad corporate behavior.

From a methodological perspective, our results suggest that we also must be careful in our research not to rely on small and limited samples that take into account only what corporations voluntarily reveal about their activities (the most popular approach in

previous environmental management research). The literature on corporate reputation-building might yield insights into how these data are created, processed, presented, and used, as well as what effect they have. We must take advantage of the large data sets available in the “big data” era that might allow us to measure real results and impact. Credible secondary information should combine information from many sources. Analytical partnerships with local stakeholders and government agencies are a way of obtaining more robust information. They are needed as a check on the data. Finally, especially if large trustworthy datasets are not available, future research might want to explore the potential of field experiments to control all the potential disruptive effects and better understand observable changes.

Regarding our own study, there are methodological limitations that might be overcome in the future. We were able only to compare the environmental performance of the top international firms with the environmental performance of peer firms and other firms that provide environmental information. The limited percentage of firms outside the top international groups that provide environmental information prevents us from conclusively asserting that our results are representative. Firms not among the top 100 international firms probably receive less stakeholder pressure and scrutiny, and therefore only a select few of these firms publish environmental performance reports. Noninternational firms might be more inclined to provide environmental information only when their environmental performance is good (a pragmatic approach). Future analysis might also consider a single industry to expand the focus in terms of the number of organizations within the same business activity and analyze specific factors in the industry.

Finally, future studies should carefully review the inferences we draw from our findings. Although we have been quick to cast aspersions on business, our interpretations require additional scrutiny. Legitimation is better than the alternative—namely, firms secretly trying to export pollution—but it does not produce the same gains for the firm and society that might come about if advanced environmental practices were globally diffused. The existence of sophisticated approaches to greenwashing strategies (Bowen & Aragón-Correa, 2014) is a possibility to be explored in the context of international firms.

Practical Implications

Our results have relevant implications for policy makers, stakeholders, and managers. We believe that

a proper regulatory framework for environmental disclosure is an urgent requirement to clarify the environmental situation of firms (Doshi et al., 2013). It is apparent that generally accepted accounting standards for environmental performance are needed. These standards should be common across countries so that they will be truly comparable.

Governments have been successful in bringing some type of universal system to business financial accounting. While not perfect, a similar type of system is needed for corporate environmental accounting. This system might be separate, or it might be appended to and incorporated in the existing financial accounting system. Although progress has been made in some countries, so far it is fragmented, disconnected, and mostly local. Ultimately, we have to move beyond a voluntary system of disclosure that may be subject to abuse because of lack of standardization, comparative analytics, and independent auditing.

Environmental information affecting society should not be provided solely through the discretionary activities of firms. Under current conditions it is very difficult to analyze and interpret this information. So far, government-mandated provision of information has produced isolated variables of individual facilities (e.g., the U.S. Toxics Release Inventory data) of questionable reliability and usefulness. Governments should clearly establish not only what information should be included and what firms are affected but also, and very specifically, how critical indicators should be measured. Practical considerations suggest that it would be better for governments to require a limited number of variables with clear criteria than a broad group of variables with doubtful interpretation.

The growing globalization of firms' operations demands that a program of standardization be coordinated on a supranational basis. Different supranational economic entities (e.g., the European Union, NAFTA, Mercosur, and others) might be platforms for exploring supranational initiatives. Simple technical agreements covering the information corporations should provide are the best route to follow. The availability of legitimate technical standards for disclosure that are accepted and recognized by leading countries willing to implement them would be good progress, even if some countries do not make them a requirement.

Our ideal solution is international disclosure standards accepted internationally and enforced by the governments in a way that is similar to how governments have supported the creation of global

accounting standards. To communicate the environmental performance of the firm should be a priority for global governments because it is not in their interest to see environmental conditions deteriorate even more. If our ideal global standard is beyond the reach of today's global governments, then we would recommend more incremental approaches whereby the world can move gradually in this direction. Business leaders should play a role in creating common standards of this nature because it is in their interest to level the playing field and not have individual firms manipulate the system for their benefit.

If progress were made on these fronts, it would allow internal and external stakeholders to regard corporate disclosure as a more accurate reflection of corporate performance. Social rating agencies might focus on a more analytical approach to provide comparative information about progress in firms. Environmental reporting should be updated regularly to provide information in a clear and open way so that corporate performance can be compared and benchmarked.

We reach these conclusions because the results of our analysis suggest that the business model existing rating agencies use may be pushing firms to purchase legitimacy through disclosure rather than making real environmental improvement. Considering the urgency of the environmental issues and the difficulties in generating international consensus, a minimum level of stakeholder cooperation is needed to create better standards. In the absence of government action, global stakeholders (multiple NGOs and green activists) will probably play an even more relevant role in the future (Devinney, McGahan, & Zollo, 2013) and should come to some type of collaborative agreement on the types of reporting standards needed and how they will be implemented.

For managers of international firms, the growing relevance of their international operations and social interest in environmental issues may yet generate more stringent and specific requirements for performance and disclosure. The committed firms might want to partner with governments (Lin, 2014). Business leaders should play a relevant role in this process. International firms' managers will have to pay more attention to the difficult balance between legitimation and transparency to avoid local, regional, or global risks in reputation. They have much to gain from their contributions toward creating consolidated global standards for consistent environmental reporting. It is in the interests of every honest business firm to be involved in this process.

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